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AI MICRO
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LOADING UP FOR THE LONG HAUL

When you commit to one of the new high-horsepower mainframes, you're also buying into a vendor's strategy.

by Lee Keough, Industry Editor

When IBM introduces a new mainframe series, as it did this year with the 3090 "Sierra" line, it causes a domino effect in the computer industry. Other mainframe vendors, faced with even greater domination by IBM, unveiled new top-of-the-line products in an effort to offset the impact of the Sierra introduction.

With this year's announcements, users have more options than ever. IBM alone sells three mainframe lines—the 3090, the 308X, and the 43XX, although the latter is typically considered a supermini series. The two Japanese-backed plug-compatible vendors, National Advanced Systems Inc., Mountain View, CA, and Armdahl Corp., Sunnyvale, CA, introduced their versions of the 3090. Two long-time IBM competitors, Burroughs Corp., Detroit, and Honeywell Inc., Minneapolis, also unveiled new mainframe lines,

primarily to prevent customer defections to IBM.

As mainframe options increase, purchasing decisions become more difficult. In most cases, corporations that decide to buy into the latest generation of mainframes are not only buying a piece of hardware, they are also making a long-term commitment to a vendor and its philosophy. "It's like a merry-go-round," says Edward Wagner, president of Applied Management Services, a Patchogue, NY, consultancy. "It's a financial as well as a technical issue—and a big concern."

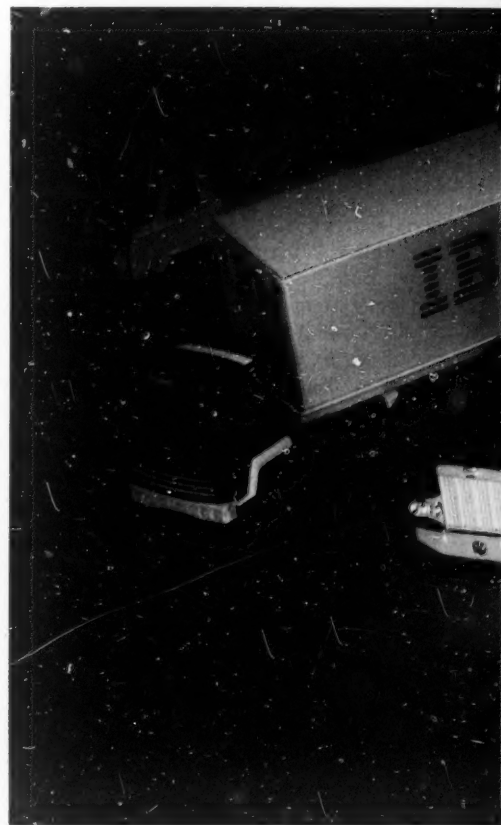
One of the biggest questions facing MIS/dp executives is whether IBM's 308X series is obsolete. Until the unveiling of Sierra, the 3084QX, the top model in the 308X line, was considered the foremost general purpose computer. On the surface, the Sierra line doesn't offer much more than the 3084QX.

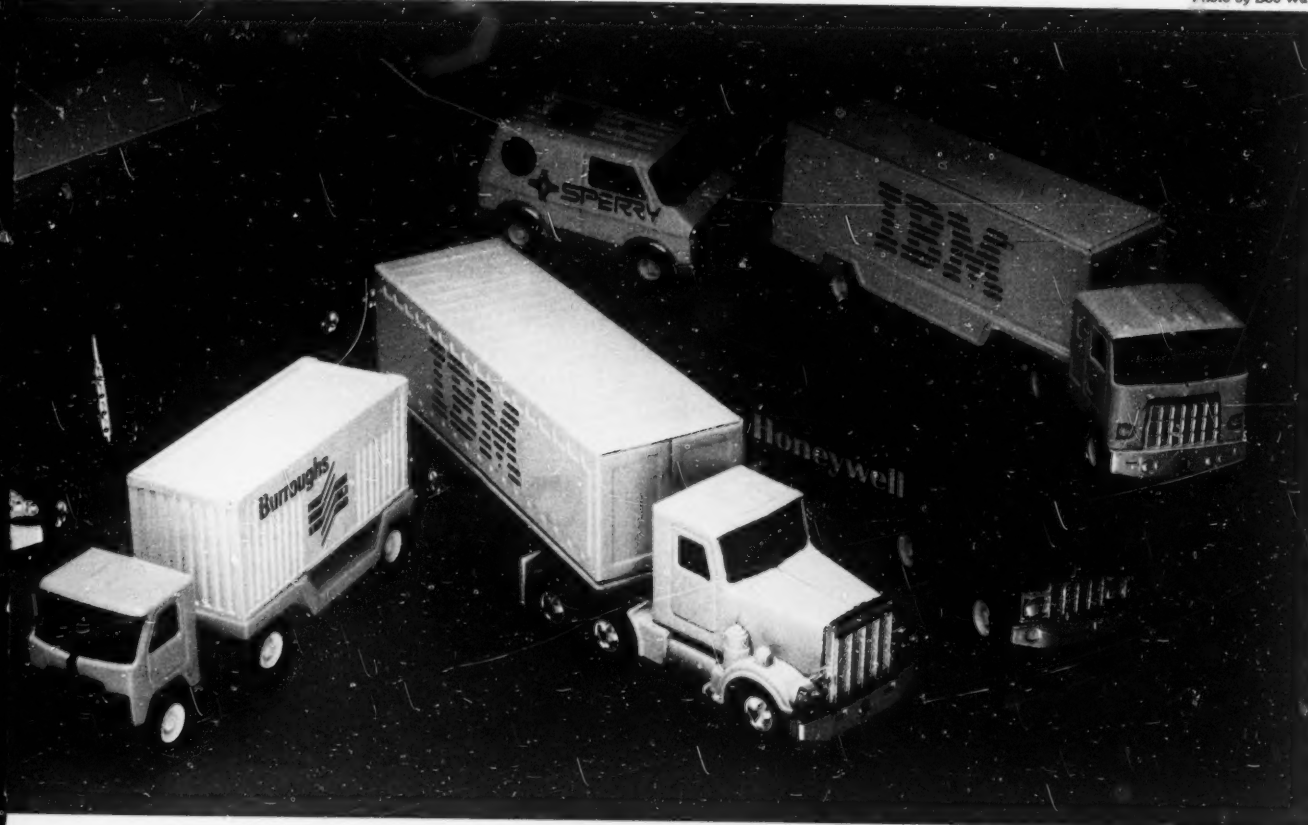
The 3090/200—the only available model in the Sierra line—offers the ability to process 28 million instructions per second (MIPS), not much more power than the 3084QX, which operates at 27 MIPS. The 3090/200 costs \$5 million, about twice the cost of a used 3084QX.

But migrating to Sierra offers users many advantages, the most important being that the line will be the premier family of IBM processors for the next four or five years. Users who stay with the 308X series may be left behind because their machines are not upgradeable to 3090s.

"The 3080 is a good machine that has served users well, but if you're planning for the future, it is very much dead," says Tom Henkel, a senior market analyst with the Yankee Group, the Boston-based market researchers.

International Data Corp. (IDC), the Framingham, MA-based market-re-





search house, says user MIPS demand is growing at an annual rate of 30 percent. For users with voracious power appetites, the 3090 family or comparable plug-compatible equipment is the only way to go. The 3090/400, which has been announced but will not be available until the fourth quarter of next year, is rated at 50 MIPS.

The 3090 machines pack all this power in half the space of the 308X series. The smaller footprint is possible because the 3090's chips, which use emitter-coupled logic, are jammed into liquid-cooled packaging. The cooling system allows the high-speed processing of emitter-coupled-logic chips without a meltdown.

Despite his contention that 308X machines don't have a bright future, Henkel says it would make sense for current 308X users to migrate through that series rather than switch to Sierra

immediately. He adds that users should buy upgrades on the used market. "You'd be crazy to buy from IBM," he contends.

However, corporations looking to upgrade from 303X or 43XX processors may be wise to bypass the 308X series entirely and move right into the 3090 line, analysts say. The 3090/200 is actually two tightly coupled 15-MIPS processors; analysts agree that the next member of the Sierra family probably will be a single-processor 3090. Analysts expect a 15-MIPS to 17-MIPS 3090 uniprocessor to appear as early as the first quarter of next year.

"Just the intimation of the 3090 uniprocessor has depressed the price of the 3080," says Edward Wagner. Henkel adds that as soon as IBM comes out with the 3090 uniprocessor, "the 3080 will be deadlier than it is now."

Jumping directly to the 3090 family will offer current 303X and 43XX users more advantages than just a clear path to high-range computing power. The expanded storage offered by the 3090 series not only provides greater main storage, but it also allows faster transaction rates, which will significantly improve processor performance.

Analysts believe IBM may be putting features into the 3090 that will be revealed to the public later. Frederic Withington, an analyst with Arthur D. Little Inc., a Cambridge, MA-based management consultancy, predicts IBM will expand the use of special processors serving as adjuncts to the central processing unit (cpu). IBM has already announced a vector-processing capability for Sierra, and Withington says more such announcements should follow as the product line matures.

"There will be movement away from

the large, monolithic central processor, toward a more modular system," says Wagner. Wagner and other observers believe instructions have been written into the 3090's memory chips that will enable users to offload components of the MVS/XA operating system into support processors. Offloading will significantly reduce the power needed to support the operating system.

The speculation over which features may be hidden in the 3090 series is fueled by past practices. IBM has released processors containing unannounced capabilities in the past. For instance, IBM did not immediately announce the extended architecture (XA) feature in the 308X series. But even without hidden features, it is clear the 3090 is superior to the 308X in every way but price.

Whether the Sierra is better than its plug-compatible imitations is another question. "Both the Amdahl and NAS machines look like competitive products on paper," says Francis Gens, the IBM-watcher for IDC. "The only curve IBM has thrown at them so far is the vector-processing capability."

NAS was the first to announce a competitor to Sierra, with its AX/SL 60 and AX/SL 80 processors, manufactured in Japan by Hitachi Ltd. The AX/SL 60 is a uniprocessor, but at 28 MIPS it offers about the same power as

"By the second quarter of 1986, IBM will have delivered all the 3090/200s anyone wants."

West, Comdisco

the 3090/200. The NAS machine costs \$4.8 million, slightly less than the IBM model. In addition to being smaller, the AX/SL 60 is air-cooled, relieving customers of the burden of maintaining a liquid-cooled system. At 50 MIPS, NAS' AX/SL 80 rivals the power of IBM's 3090/400.

Amdahl took longer to announce its latest mainframe offering, the Apache series. Amdahl designed its series with components made by the Japanese giant Fujitsu Ltd. Amdahl says Apache will be available in three different configurations, but only one version, the mid-range 5890 Model 300, will be shipped in the near future. Amdahl says its mid-range model will be available in the second quarter of next year, the 200 and the 600, will not be shipped until 1987.

Amdahl's 5890 Model 300 offers greater processing power—36 MIPS to 38 MIPS—than IBM's 3090/200 for the same price. Amdahl is also touting Apache's "multiple domain" feature as an advantage over Sierra. The multiple domain facility is a hardware feature that lets Apache users run a number of operating systems on one machine without using IBM's Virtual Machine (VM) operating system as a foundation, as is required with IBM mainframes. VM allows a mainframe to run under other operating systems, thereby partitioning the machine for different applications, but it is expensive and drains processing power.

IDC's Gens believes Amdahl's advantage over IBM may be short-lived. The Start Interpretive Execution (SIE) assist, a hardware feature introduced by IBM with the 3090, allows more efficient use of VM. When coupled with the VM/XA migration aid, SIE assist reduces the power needed by VM to partition under other operating systems. Although the IBM scheme still uses more power than Amdahl's multiple domain system, Gens believes Amdahl will eventually lose this advantage. SIE assist is also available for 308X machines.

The two chief considerations for mainframe buyers are compatibility with IBM operating systems and performance reliability. IBM has a real or perceived advantage in both, says Gens. But at this stage of a mainframe cycle, a third factor—availability—also carries great importance.

Russell West, vice president of strategic planning for Comdisco Inc., a large lessor and used-computer dealer based in Rosemont, IL, says plug-compatible vendors once had the advantage of being able to deliver a product faster than IBM could. Since the release of IBM's 3090/200, this claim is no longer true. "By the second quarter of 1986, IBM will have delivered all the 3090/200s anyone wants," he says. Although NAS could regain the availability edge if it ships its 50-MIPS AX/SL 80 as planned next spring, Amdahl is falling behind IBM's delivery dates with its Apache line. "All of a sudden, IBM can deliver and Amdahl can't," says West. (Continued on page 76)

PROCESSOR BASES*

Vendor	Installations (estimated)	Market Share (%)
IBM	5,507	70.94
Sperry	770	9.92
Amdahl	670	8.63
National Advanced Systems	320	4.10
Control Data	235	3.00
Burroughs	205	2.64
NCR	28	.36
Honeywell	27	.34

*Large processors upgradable beyond 5 MIPS.

Source: Computer Intelligence Corp.

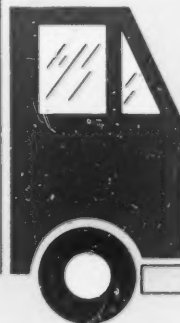


Chart by Vincent J. Gallo

CHOICES TO GET TOUGHER

It's not going to get any simpler for MIS/dp directors to weed through mainframe offerings. Industry observers expect the market to become even more complicated, with distinctions between product lines blurring as vendors continue to release smaller and more powerful machines.

By the end of next year, users looking for an IBM mainframe that processes about 7.5 million instructions per second (MIPS) will probably be able to choose from three different product lines, says Russell West, vice president of strategic planning for Comdisco Inc., a Rosemont, IL, used-computer dealer. Currently, IBM offers only one mainframe—the 3083 uniprocessor—that operates at 7.5 MIPS. West predicts IBM will announce a 7.5-MIPS processor in the 4300 series in the first quarter of next year. He also expects IBM to offer a uniprocessor rated at 8 MIPS to 10 MIPS within the 3090 line by the end of next year.

(Continued from page 74)

For Morgan Stanley & Co., the New York-based investment bankers, early product delivery plays a central role in purchasing decisions. Morgan Stanley's data center supports 1,500 employees; primarily stock brokers, who need sub-second mainframe response times. Joel Nachmann, manager of hardware planning for Morgan Stanley, says the corporation added three 3090/200s to the five NAS 9080 mainframes in its data center to meet growing processing needs. Nachmann, a satisfied NAS customer, is currently considering the purchase of another mainframe, this time a 50-MIPS processor. He says he plans to buy an AX/SL 80 from NAS. "Not only is there a significant financial advantage, but we can get it three to six months earlier than a 3090/400," he says. "Also, there is an unbelievable environmental [cost] advantage." The NAS AX/SL 80 is about half the size of a 3090/400. For Morgan Stanley, located in New York's crowded financial district, the subsequently reduced cost of floor space, power, and air conditioning is significant.

Regardless of benefits offered by plug-compatible machines, some users will buy only from IBM. Wagner of Applied Management Services says "fear, uncertainty, and doubt" about buying from other vendors is increasing. "With the rapid pace of technology, users are becoming more and more concerned they will be left out in the cold," he says. "It's no longer the path of least resistance, or a philosophical issue." Wagner says the stakes are getting

higher for equipment buyers. "You can't view it as just buying a cpu anymore," he says. "Users are buying networks. They are making \$5 million to \$20 million investments and setting the direction of their shops for years to come."

Ron Kriegel, manager of resource management for the State of Illinois data center, agrees. Kriegel is a satisfied Amdahl customer; his center has Amdahl 5860s and IBM 308Xs. But Kriegel is awaiting the installation of a 3090/200, and he thinks his next purchase may also be an IBM processor. Kriegel worries that IBM is making it more difficult for plug-compatible vendors to match IBM performance through reverse engineering by embedding more of its operating system in the hardware's memory chips, or microcode. "I'm not going to commit millions of dollars without knowing if the plug-compatibles can keep up," he says.

Although Joel Nachmann agrees that IBM is making it more difficult for plug-compatible vendors to keep up, he will continue to buy plug-compatible machines. Nachmann says he will judge products based on what is currently available, not what is rumored for the future. Besides, he says, "for IBM to in-

troduce a revolutionary change is contrary to its marketing strategy. The day you have to discard everything is the day IBM lets all of its competitors back in the door."

Comdisco's West says plug-compatibles face a crunch not only because IBM is making it difficult to mimic its processors, but also because it is closing the gap on pricing. Plug-compatible vendors may find it tough to devote the necessary funds for research and development and keep their prices significantly lower than IBM's, he says.

The slimmer price differentials between plug-compatible mainframes and equivalent IBM machines becomes magnified in lease rates. West says users who obtain the NAS AX/SL 60 from Comdisco will pay \$117,000 a month on a four-year lease, and \$105,300 for an IBM 3090/200. West says that although Amdahl's new mainframe is not the 3090/200's equivalent, its lease rates will be similarly high.

Plug-compatible machines have higher lease rates because Comdisco has greater confidence in the residual value of IBM mainframes, says West. He cites the greater proportion of financing for IBM mainframes as another reason for higher plug-compatible rates. Although Comdisco handles very few deals for plug-compatible vendors, West claims lease rates don't vary much among third-party lessors. He admits, however, that a user may obtain a better deal by financing a lease through a plug-compatible vendor.

Although NAS has yet to announce its lease rates for the NAS AX/SL 60, a spokesman says its leasing rates will be competitive with those for the IBM 3090/200. Nevertheless, since Comdisco estimates 80 percent of users lease rather than purchase mainframes, it won't bode well for plug-compatible vendors if the financial advantage to leasing a plug-compatible mainframe is only marginal.

Although many analysts say plug-compatible vendors will find it tougher to meet IBM head on in the future, these vendors are not in serious danger. "They constantly have to walk that tightrope," says Gens, "but I think the plug-compatibles are in pretty good shape for this mainframe generation."

One question facing MIS/dp is whether IBM's 308X series is obsolete.

The squeeze will come, says Gens, with Summit, IBM's next generation mainframe. Summit's introduction is expected as early as 1988. Gens speculates that Summit could be the first truly programmable mainframe processor, meaning users will be able to change the processor's dedication easily to optimize the running of specific applications.

Where does all this activity in the IBM market leave other mainframe vendors? At the moment, no worse off than before, say analysts. Most of "the Bunch" vendors—Burroughs, Univac (now Sperry Corp., Blue Bell, PA), NCR Corp. (Dayton, OH), Control Data Corp. (Minneapolis), and Honeywell, the five largest mainframe makers after IBM—are offering mainframe models intended to prevent current customers from switching to IBM.

Burroughs' new line of large processors, the A 15 series, offers the same performance as the IBM 3090. Computer Intelligence Corp., a market researcher based in La Jolla, CA, estimates the A 15 series will provide power ranging from 17 MIPS to 59 MIPS. Burroughs is trying to attract new users at the low end of its mainframe line, the A 3 series, to the new machine and is trying to interest third-party software houses in designing applications for its machines. In addition, Burroughs mainframes now provide gateways to Systems Network Architecture (SNA), IBM's mainframe communications scheme.

Sperry also supports SNA, but it is banking on Bell Labs' Unix operating system to increase its market share. Sperry's mainframes, the 1100/70 and 1100/90, operate at 1 MIPS to 26 MIPS and run under Unix. Jan Brundin, vice president of product strategy, says Sperry is positioned for "the emerging Unix market," which he says will grow as MIS/dp becomes more involved with factory operations.

Honeywell attempted to differentiate itself from the pack this year by offering a mainframe series that can perform array processing on a mainframe manufactured by the Japanese giant NEC. The DPS/90 mainframe gives users the ability to perform general data-processing functions and scientific

and engineering calculations on the same machine. However, the initial interest sparked by the Honeywell offering was muted when IBM introduced vector-processing for the 3090.

NCR and Control Data have a different set of problems from the other "Bunch" vendors. Although NCR has a loyal user base of banks and retailers, its most powerful machine is rated at only 7.5 MIPS. Control Data's financial troubles, which analysts blame on the vendor's peripherals and noncomputer businesses, continue to worsen. Although a spokesperson says Control Data is refocusing its efforts on the computer business, the vendor has been forced to close plants, lay off workers, and put a subsidiary up for sale. Control Data's mainframe offering, the Cyber 180, is geared to the scientific, education, and government markets.

IDC's Gens says new offerings may help "The Bunch" vendors keep their existing customer bases, but that's about all. Providing gateways to IBM

mainframes is necessary, says Gens, but relaxing proprietary reins can be dangerous. Although IBM gateways could keep some users happy, they will make it easier to defect to IBM, he notes.

Gens believes the biggest competition IBM's Sierra line faces is used equipment from older IBM lines. "The future of the IBM market is in the IBM world," he says. West of Comdisco, as might be expected, agrees. He describes the used IBM mainframe market as the wake following the boat. "In the past, users bought from plug-compatibles to have an alternative," says West. "Now the used market is the alternative, simply because IBM is making its products only marginally obsolete."

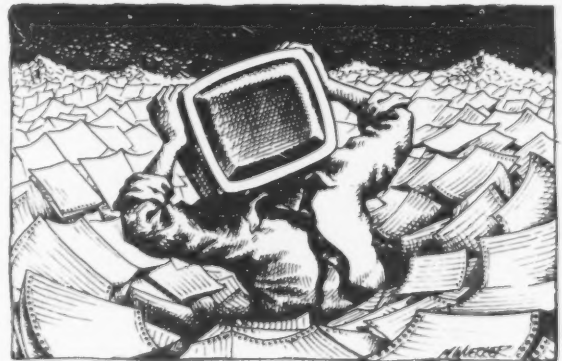
This year's activity has created a complex mainframe market for users. "Heads are spinning," says Wagner of Applied Management Services. "The MIS/dp executive today has to be a wheeler dealer in the equipment market." □

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